

**TANDBERG**

**TCD 310 MkII**

# Illustrated Parts List

## INSTRUCTIONS FOR ORDERING REPLACEMENT PARTS

For service and replacement parts contact your nearest Tandberg office or  
write to: Tandbergs Radiofabrikk A/S  
Service and Spares Department  
P.O. Box 218  
N 1301 Sandvika, Norway

Telex: 18007 kurer n

When ordering please quote the model and serial numbers together with the ordering  
number and the full description of each part required. The serial number is a seven  
digit number found on the rear of the apparatus.

Example: Model TCD 310 MkII      Serial number xxxxxxxx  
              994119      Knapp

Note!      The numbers on the illustrations are index numbers and must not be used  
when ordering. Please refer to the parts list for the ordering number and  
description.

\*      These parts are not available as replacement parts.

## INSTRUKS FOR BESTILLING AV DELER

For service og servicedeler kontakt nærmeste Tandberg kontor eller bruk adressen  
som er vist ovenfor.

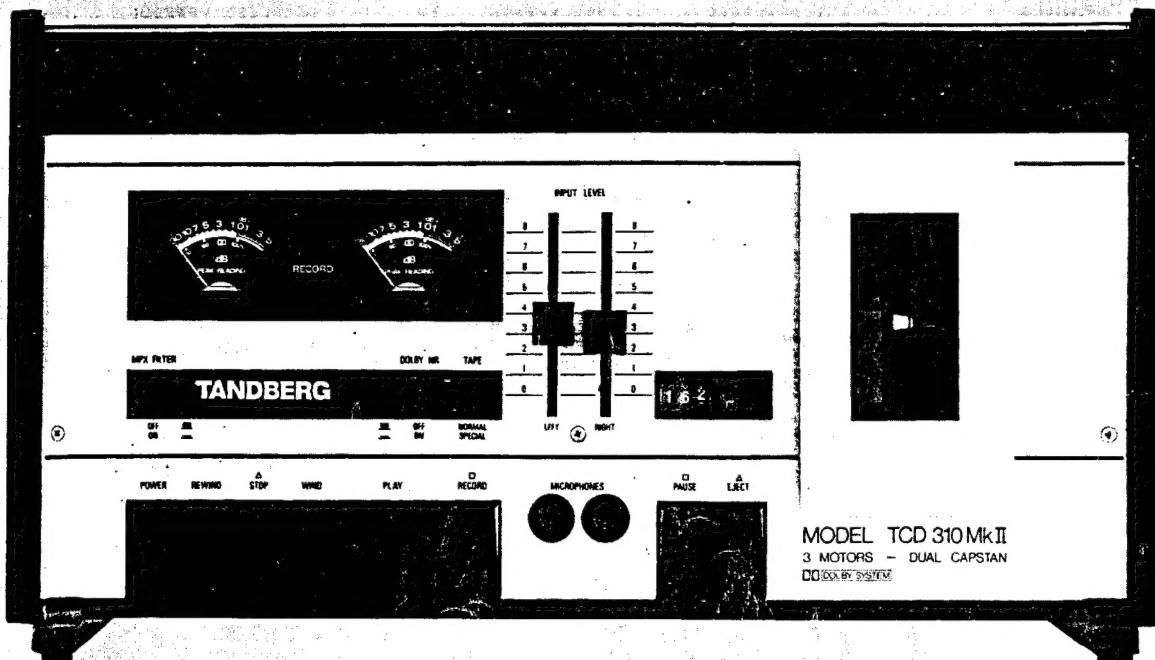
Modell og serienummer må alltid oppgis ved bestilling av deler. Bestillingsnr. og  
beskrivelse finnes i listen. Det 7-sifrede serienr. finnes på baksiden av apparatet.

Eksempel: Modell TCD 310 MkII      Serienr. xxxxxxxx  
              994119      Knapp

Merk!      Tallene på tegningene er indeksnumre og må ikke brukes ved bestilling.

Bestillingsnr. og beskrivelse finnes i listen.

\*      Leveres ikke som servicedel.



MODEL TCD 310 MKII  
3 MOTORS - DUAL CAPSTAN  
DOLBY SYSTEM

## Chassis assembly

Index		SPECIFY THIS WHEN ORDERING	Description (notes)	Reference
	Ordering No.	Beskrivelse (merknader)		
1	*	SIASSIS-ENHET	CHASSIS ASSEMBLY	
1	995103	PLATE	PLATE, TOP (LEV. M/INDEX 2+3)	
2	313191	VINDU	(SUPPLIED WITH INDEX 2 AND 3)	
3	292581	PLATE	WINDOW, COUNTER, PLASTIC	
4	994119	KNAPP	MASK, FELT	
5	353061	KNAPP	KNOB, BLACK, PLASTIC, WITH SPRING	
			BUTTON, PUSH, BLACK, PLASTIC	
6	294556	SKRUE	SCREW, PLATE, 3/8" NO. 4 CSK HD	
7	995105	SKINNE	PLATE, TOP, REAR, WITH MESH	
8	309060	SKRUE	SCREWS, PLATE, 1/4" NO. 6 PAN HD	
9	290447	SKRUE	SCREWS, PLATE, 3/8" NO. 6 PAN HD	
10	995113	DEKSEL	COVER (LEV. M/INDEX 11)	INPUT LEVEL MPX FILTER, DOLBY NR., TAPE
11	343694	VINDU	(SUPPLIED WITH INDEX 11)	
12	359928	SKINNE	WINDOW, PLASTIC	
			PLATE, FRONT	
13	*	AKSEL	(SUPPLIED WITH INDEX 13)	
14	354462	KNAPP	ROD	POWER, REWIND, WIND, PAUSE
			BUTTON, BLACK, PLASTIC	EJECT
15	352429	KNAPP	BUTTON, BLACK, PLASTIC	
16	350582	FJÆR	SPRING	
17	352263	TAPP	PEG	
18	354296	FJÆR	SPRING	
19	354110	KNAPP	BUTTON, BLACK, PLASTIC	PLAY
20	350748	KNAPP	BUTTON, BLACK, PLASTIC	STOP
21	350396	HYLSE	ARM, PLASTIC	
22	227899	SKRUE	SCREW, PLATE, 1/4" NO. 6 FLANGE HD	
23	207418	LODDEØRE	TAG, SOLDER, 4.2 MM	
24	274162	KONTAKT	SOCKET, 5 PIN DIN 180 DEGREES	MICROPHONES
			SOCKET, JACK, 3 POLE 1/4 IN.	MICROPHONES
25	294420	JACK	SURROUND, DIN SOCKET, PLASTIC	
26	313837	SKIVE	NUT, PLASTIC	
27	312156	MUTTER	SPRING, FLAT	
			FOOT, PAIR	
28	*	FOT	(SUPPLIED WITH INDEX 28 TO 30 INCL.)	
29	324297	PLATE	PLATE	
30	309693	SKRUE	FOOT, RUBBER	
31	348995	PLATE	SCREW, PLATE, 1/4" NO. 4 FLANGE HD	
32	262984	SKRUE	PANEL, PLASTIC, BLACK	
33	309599B	PLATE	SCREW, PLATE, 5/8" NO. 6 PAN HD, BLACK	
34	290211	PLATE	PLATE, SIDE WALL, LEFT	
35	272739	MUTTER	PLATE, ISOLATION	
36	349030	TRANSFORMATOR	NUT, PLATE	115/230V
		TRANSFORMATOR	TRANSFORMER	120/240V
37	334807	SKRUE	TRANSFORMER	
38	202332	SKIVE	SCREW, 4 X 8 MM PAN HD	
39	305885A	PLATE	WASHER, 4.3 MM	
40	227949	FOT	PLATE, SIDE WALL, RIGHT	
41	301596A	PLATE	FOOT, RUBBER	
42	297925	SKRUE	COVER, BOTTOM	
43	350230	SKINNE	SCREW, PLATE, 5/16" NO. 6 FLANGE HD, BLACK	
44	300612A	KLAMMER	PLATE, REAR WALL	
45	267697	LEDNING	GUIDE, PLASTIC	
			CABLE, POWER, ENGLAND, WITHOUT PLUG	ENGLISH VERSION
46	299621	LEDNING	CABLE	U.S.A. VERSION
			CABLE, POWER, WITH PLUG	EUROPEAN VERSION
47	335569	LEDNING	CABLE, POWER, WITH PLUG	SCANDINAVIAN VERSION
			GROMMET, CABLE, POWER	
48	335927	LEDNING	TUBE, CABLE, POWER	
49	284744	HYLSE	WASHER, 22 X 10.2 X 0.56 MM	U.S.A. VERSION
			WASHER	
50	*	TRANSISTOR	TRANSISTOR	
			WASHER	
51	*	SKIVE	(SUPPLIED WITH INDEX 48)	
52	*	SKIVE	WASHER	
			(SUPPLIED WITH INDEX 48)	
53	(LEV. M/INDEX 48)		WASHER	
54	*	SKIVE	(SUPPLIED WITH INDEX 48)	
			WASHER	
55	(LEV. M/INDEX 48)		(SUPPLIED WITH INDEX 48)	
56	296417	SKRUE	SCREW, 2.6 X 8 MM PAN HD	
57	271367	MUTTER	NUT, 2.6 MM	
58	309247	BRAKETT	BRACKET	
59	290842	SKRUE	SCREW, 3 X 6 MM PAN HD	
60	274162	KONTAKT	SOCKET, 5 PIN DIN 180 DEGREES	RADIO
			SOCKET, PHONO	OUTPUT, INPUT
61	283773	KONTAKT	SOCKET, JACK, 3 POLE 1/4 IN.	PHONES
62	294420	JACK	SCREEN	
63	310397	PLATE	HOLDER, FUSE	
64	277509	HOLDER	FUSE, 1.6 A, 5 X 20 MM, SLOW	S101, 230/240 V
			FUSE, 2 A, 1 1/4" X 1/4"	S101, 115 V
65	272207	SIKRING	FUSE, 2 A, 1 1/4" X 1/4"	S101, US BASE
66	289629	SIKRING		
67	307464	SIKRING		

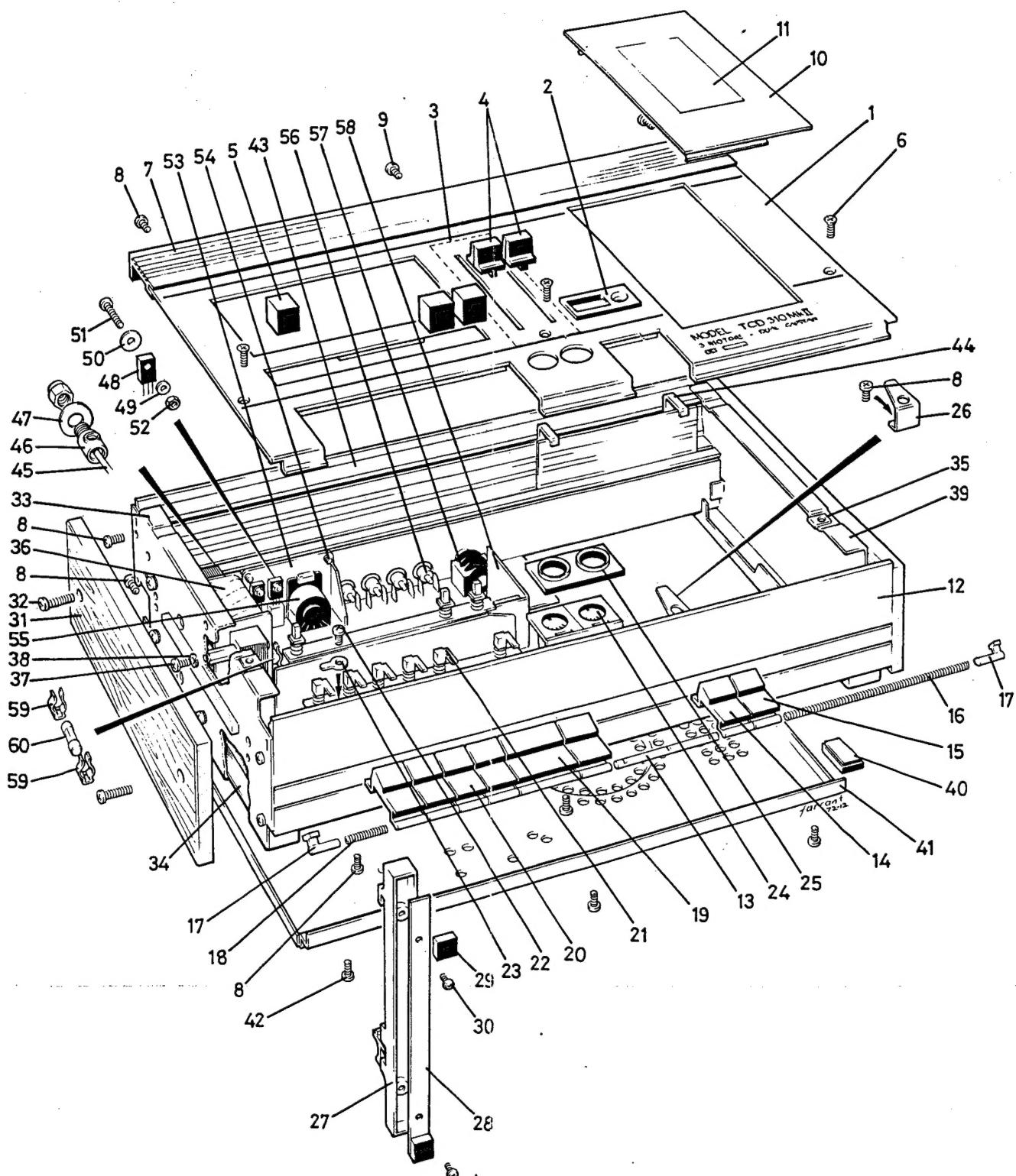


Fig.1 Chassis assembly

### Meter board assembly

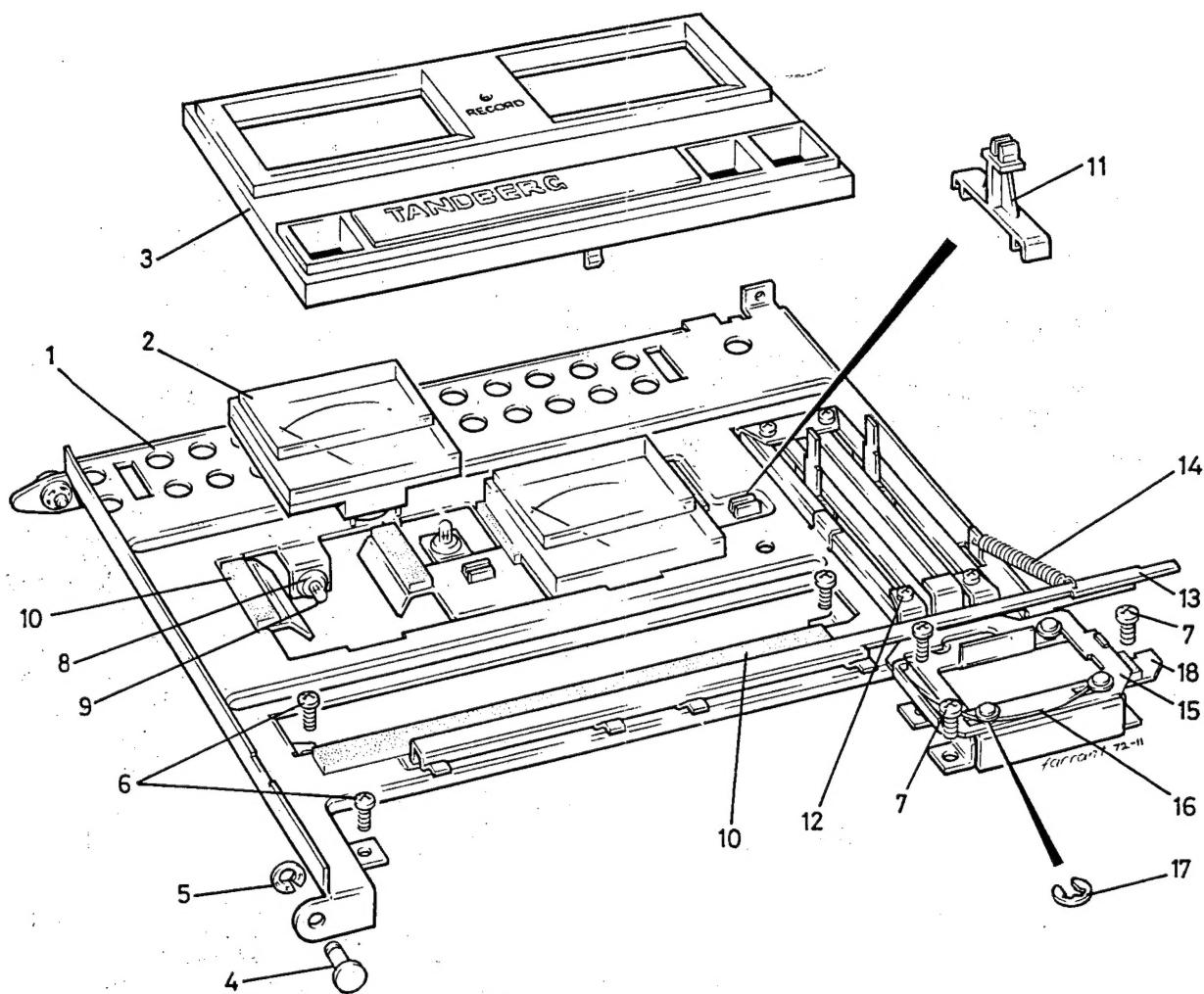


Fig.2 Meter board assembly

SPECIFY THIS WHEN ORDERING				
Index	Ordering No.	Beskrivelse (merknader)	Description (notes)	Reference
1	995104	INSTRUMENTKORT-ENHET RAMME, (LEV. M/INDEX 1C)	METER BOARD ASSEMBLY FRAME (SUPPLIED WITH INDEX 10)	
2	348075	INSTRUMENT	METER	
3	995100	HOLDER	HOLDER, METER	
4	303701	AKSEL	POST, PIVOT	
5	245649	SKIVE	RING, CIRCLIP, 4 MM	
6	220392	SKRUE	SCREWS, PLATE, 1/4" NO. 6 PAN HD	
7	309060	SKRUE	SCREWS, PLATE, 1/4" NO. 6 PAN HD	
8	285720	TUBE	GROMMET, RUBBER	
9	995102	LAMPE	BULB, 14 V 80 MA	
10	250477	LIST	STRIP, FOAM RUBBER, 3 X 9 MM	
11	289765A	KLAMMER	GUIDE, PLASTIC	
12	269255	SKRUE	SCREW, 3 X 4 MM PAN HD	
13	310123	SKINNE	ARM, LOCKING	
14	279040	FJÄR	SPRING	
15	291726	RAMME	PLATE	
16	291022	FJÄR	SPRING	
17	239651	SKIVE	RING, CIRCLIP, 3.2 MM	REC. LAMP, METER ILLUM.

## Drive assembly

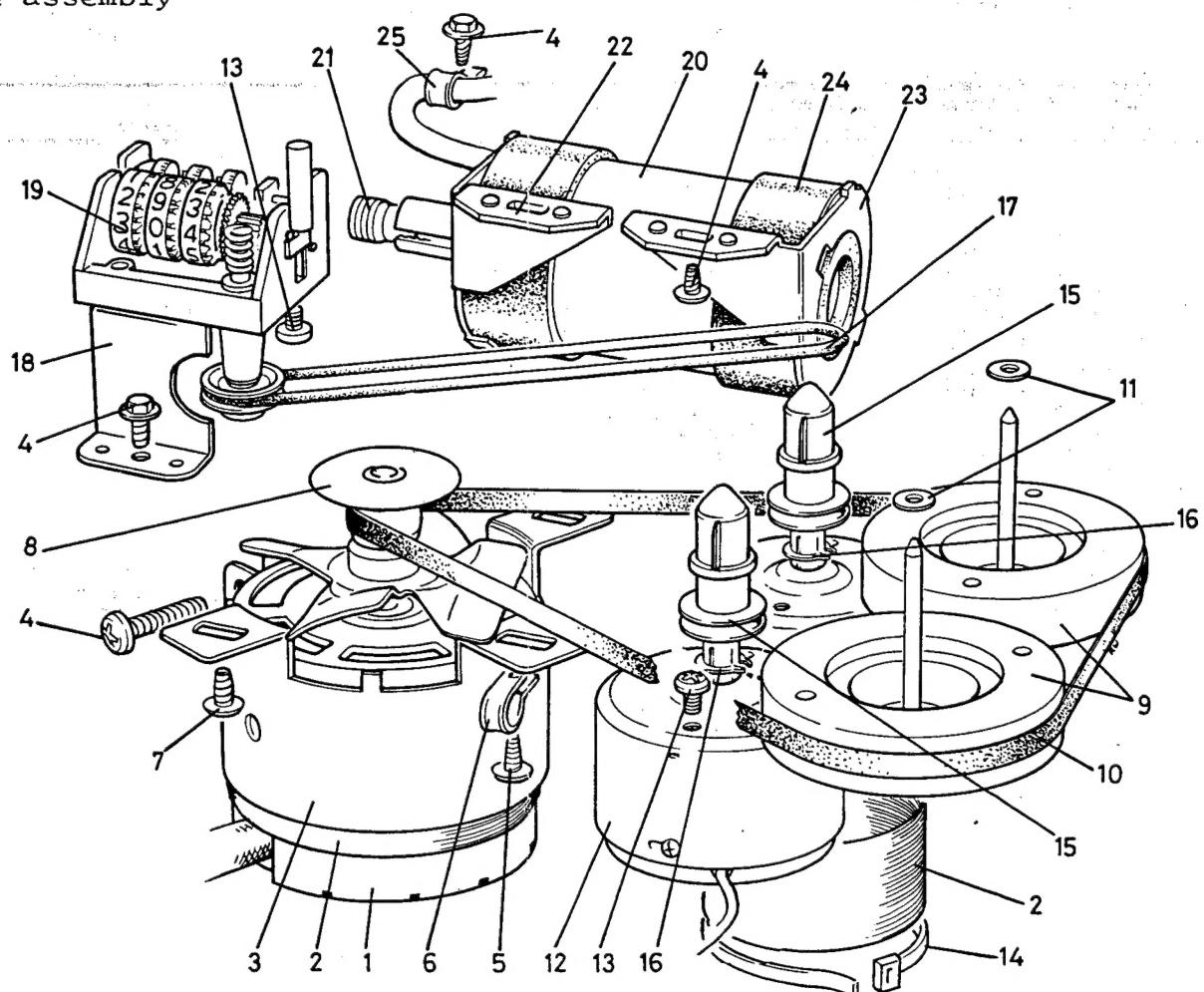


Fig. 3 Drive assembly

SPECIFY THIS WHEN ORDERING		Description (notes)	Reference
Index	Ordering No.		
1	280405	FREMDRIFTS-ENHET MOTOR	DRIVE ASSEMBLY
2	306775	SKJERM	MOTOR
3	302645	KLAMMER	SCREEN
4	262984	SKRUE	BRACKET, SUPPORT, MOTOR
5	288141	SKRUE	SCREW, PLATE, 5/8" NO. 6 PAN HD, BLACK
6	215507	KLAMMER	SCREW, PLATE, 3/8" NO. 6 FLANGE HD
7	346854	SKRUE	CLAMP, CABLE, NYLON, 9 MM
8	994158	DRIVHJUL	SCREW, PLATE, 3.5 X 6.3 MM HEX HD
9	994159	DRIVHJUL	PULLEY, DRIVE, 50 HZ
9	994111	SVINGHJUL	PULLEY, DRIVE, 60 HZ
10	994183	(PARVIS TILPASSET, OG MED INDEX 10)	FLYWHEEL
11	285369	RING	(SUPPLIED IN MATCHED PAIR AND WITH INDEX 10)
12	284823	SKIVE	BELT, DRIVE, RUBBER
13	269255	MOTOR	WASHER, 6 X 2.7 X 0.5 MM, PLASTIC
14	319506	SKRUE	MOTOR
15	994113	BÅND	SCREW, 3 X 4 MM PAN HD
15	994113	AKSEL (LEV. M/INDEX 16)	STRAP, PLASTIC
16	213826	RING	SPINDLE, TAPE REEL
17	309600	RING	(SUPPLIED WITH INDEX 16)
18	286597	BRAKETT	RING, RETAINING, EXTERNAL, 6 MM
19	280132	TELLER	BELT, DRIVE, RUBBER
20	994184	TREKKMAGNET	BRACKET, SUPPORT, COUNTER
21	264212A	SKRUE	COUNTER
22	995101	KLAMMER	SOLENOID
23	302300	KLAMMER	SCREW, NYLON
24	300942A	HYLSE	BRACKET
25	202684	KLAMMER	BRACKET
			L1, L2, START SOLENOID
			HOUSING, RUBBER
			CLAMP, CABLE, NYLON, 5 MM

## Motor board assembly

SPECIFY THIS WHEN ORDERING				
Index	Ordering No.	Beskrivelse (merknader)	Description (notes)	Reference
1	*	MOTORPLATE-ENHET	MOTOR BOARD ASSEMBLY	
2	*	PLATE	PLATE, SUPPORT, MOTOR	
3	302020	AKSEL	POST, PIVOT	
4	245649	SKIVE	RING, CIRCLIP, 4 MM	
5	229824	KLIPS	CLIP	
6	301395	HYLSE	CAM, NYLON	
7	301747A	SKJERM	REFLECTOR, ILLUMINATION	
8	995102	LAMPE	BULB, 14 V 80 MA	
9	285720	TUBE	GROMMET, RUBBER	
10	355014	PLATE	DISC, THRUST BEARING	
11	994117	PLATE	PLATE, MOUNTING, FLYWHEEL	
12	290842	SKRUE	SCREW, 3 X 6 MM PAN HD	
13	207173	LAGER	BEARING, 2.5 MM	
14	303622	KULE	BALL, BEARING	
15	301323	ARM	LEVER, SOLENOID	
16	300964	ARM	ARM	
17	304685	FJÆR	SPRING	
18	994112	BRAKETT	BRACKET, WITH SPINDLE	
19	223675	LODDEØRE	TAG, SOLDER, 4.2 MM	
20	346854	SKRUE	SCREW, PLATE, 3.5 X 6.3 MM HEX HD	
	284119	VENDER	SWITCH, LEAF, N/O	
21	289083	VENDER	SWITCH, LEAF, C/O, WITH BRACKET AND SCREW	
22	269255	SKRUE	SCREW, 3 X 4 MM PAN HD	
23	994122	BRAKETT	BRACKET, SUPPORT, PUSH SWITCH	
24	300497	VENDER	SWITCH, PUSH	
25	350827	HYLSE	ARM, PLASTIC	
26	301675	ARM	LEVER, PAUSE	
27	302997	AKSEL	POST, PIVOT	
28	286051	FJÆR	SPRING	
29	303004	BRAKETT	BRACKET, SUPPORT, LEAF SWITCH	
30	994114	BRAKETT	BRACKET, EJECT MECHANISM, CASSETTE (SUPPLIED WITH INDEX 31, 32 AND 33)	
31	230363	FJÆR	SPRING	
32	230542	SKIVE	RING, CIRCLIP, 2.3 MM	
33	994124	ARM	LEVER, WITH SPINDLE	
34	230363	FJÆR	SPRING	
35	285268	ARM	LEVER	
36	230542	SKIVE	RING, CIRCLIP, 2.3 MM	
37	202303	TUBE	TUBE, RUBBER	
38	352385	BRAKETT	BRACKET, SUPPORT, CASSETTE DRAWER	
39	351581	STRØMPE	SLEEVE, RUBBER	
40	301668	AKSEL	SPINDLE	
41	237970	SKIVE	RING, CIRCLIP, 1.5 MM	
42	300490	BRAKETT	BRACKET, CASSETTE DRAWER	
43	289413	FJÆR	SPRING	
44	304678	TAPP	POST, PIVOT	
45	287380A	ARM	ARM	
46	237360	FJÆR	SPRING	
47	293824	FJÆR	SPRING	
48	304103	ARM	ARM	
49	301316	AKSEL	POST, PIVOT	
50	994120	STYRING	GUIDE, CASSETTE, LEFT (SUPPLIED WITH INDEX 52 AND 53)	
51	292875	SKRUE	SCREW, PLATE, 3/8" NO. 4 FLANGE HD	
52	291791	FJÆR	SPRING, CASSETTE DRAWER, LEFT	
53	299606	SKRUE	SCREW, PLATE, 3/16" NO. 2 PAN HD	
54	252158	LIST	STRIP, FOAM RUBBER, 6 X 7 MM	
55	994121	STYRING	GUIDE, CASSETTE, RIGHT (SUPPLIED WITH INDEX 53 AND 56)	
56	290110	FJÆR	SPRING, CASSETTE DRAWER, RIGHT	

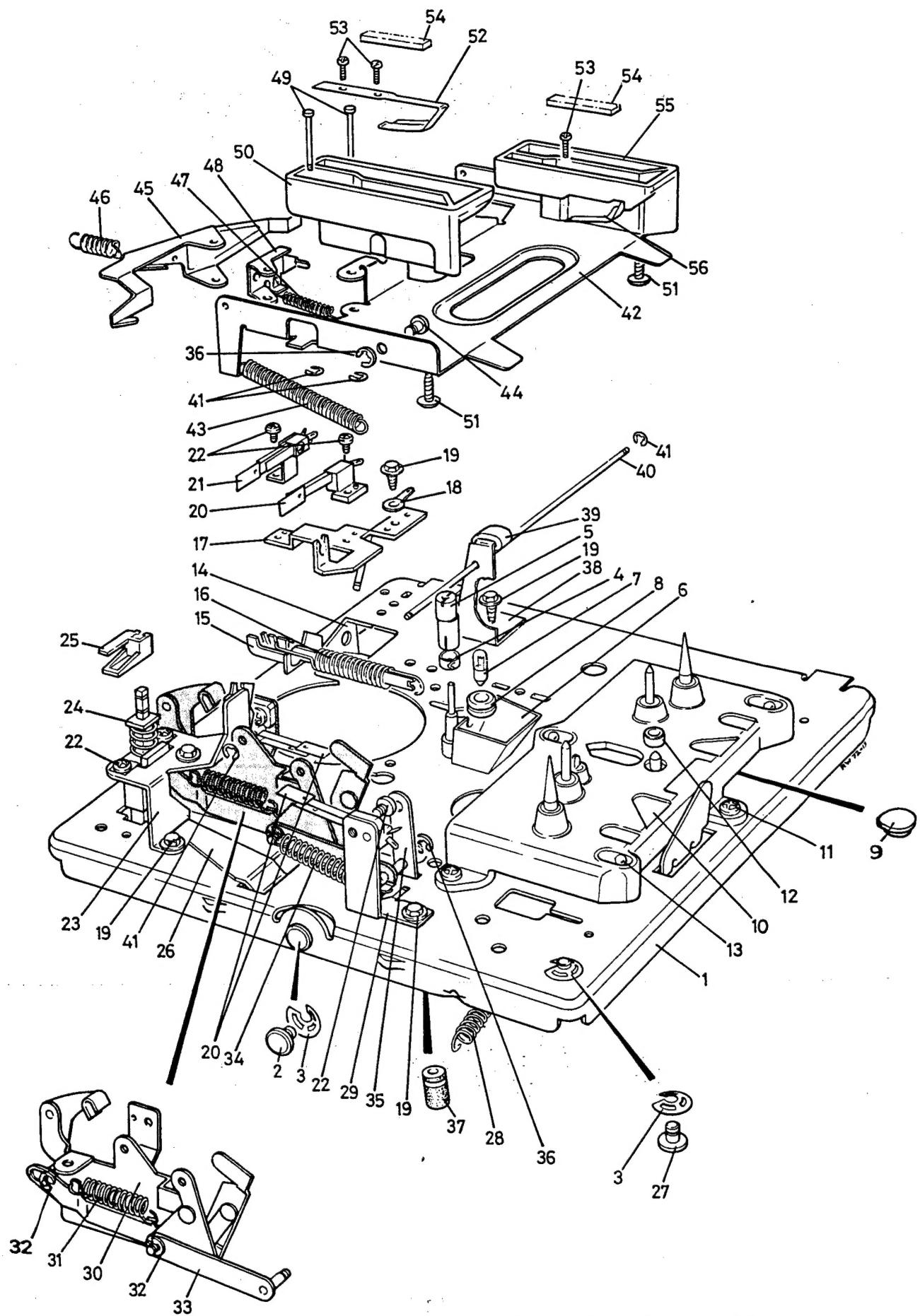


Fig. 4 Motor board assembly

## Head plate assembly

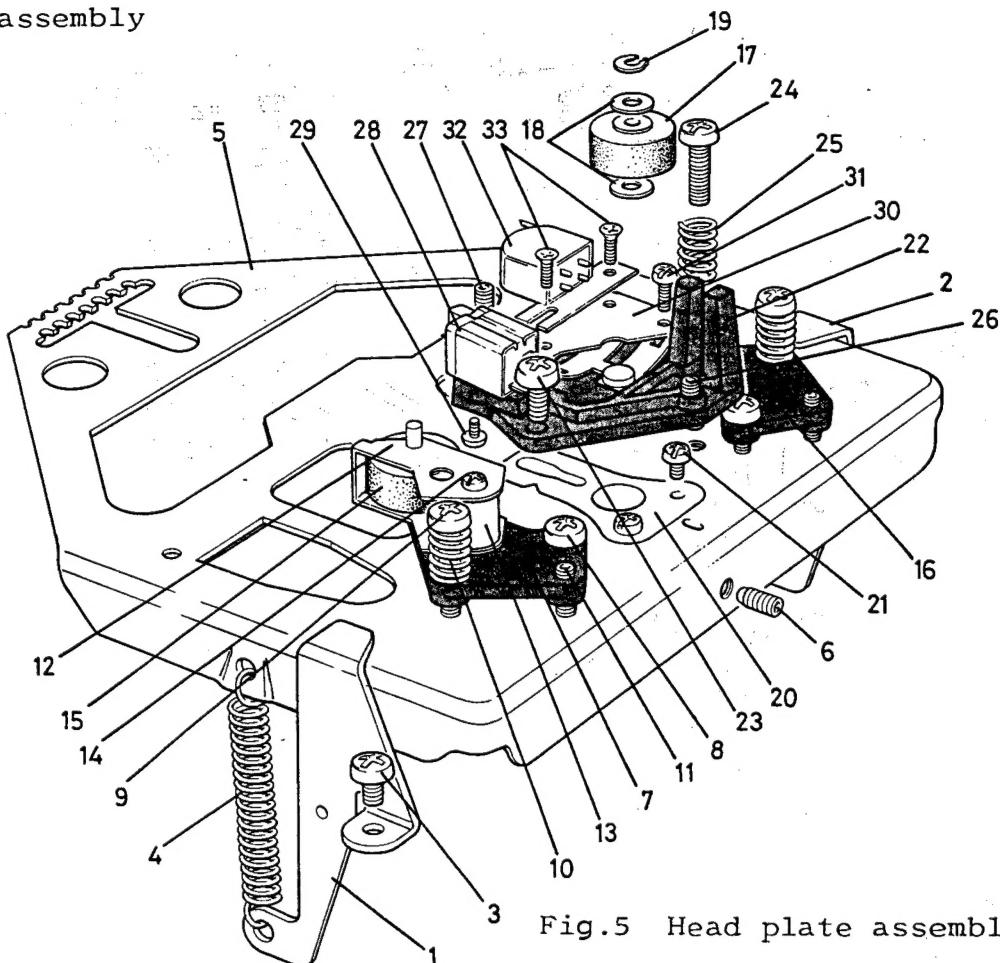


Fig.5 Head plate assembly

Index	SPECIFY THIS WHEN ORDERING		Description (notes)	Reference
	Ordering No.	Beskrielse (merknader)		
1	*	HODEBRO-ENHET	HEAD PLATE ASSEMBLY	
2	304333A	ARM	BRACKET, GUIDE, HEAD PLATE, LEFT	
3	302652B	ARM	BRACKET, GUIDE, HEAD PLATE, RIGHT	
4	269255	SKRUE	SCREW, 3 X 4 MM PAN HD	
5	287732	FJÆR	SPRING	
6	*	PLATE	PLATE, MOUNTING, HEAD	
7	890002	SKRUE	SCREW, SET, 3 X 7 MM	
8	994191	PLATE	PLATE, PRESSURE, LEFT	
9	(LEV. M/INDEX 8-15)		(SUPPLIED WITH INDEX 8 TO 15 INCL.)	
10	292523	SKRUE	SCREW, 3 X 8 MM PAN HD	
11	293852	SKRUE	SCREW, 3 X 15 MM PAN HD	
12	240406A	FJÆR	SPRING	
13	890003	SKRUE	SCREW, SET, 3 X 8 MM	
14	303270A	BØYLE	BRACKET, U-SHAPED	
15	300339	BOSS	SPACER	
16	292839	SKRUE	SCREW, 2 X 12 MM PAN HD	
17	860004A	HJUL	ROLLER, PRESSURE, RUBBER	
18	994192	PLATE	PLATE, PRESSURE, RIGHT	
19	(LEV. M/INDEX 8-11, OG 17-19)		(SUPPLIED WITH INDEX 8 TO 11, AND 17 TO 19 INCL.)	
20	860004A	HJUL	ROLLER, PRESSURE, RUBBER	
21	244377	SKIVE	WASHER, 6 X 2.5 X 0.3 MM	
22	212145	RING	RING, RETAINING, EXTERNAL, 2.5 MM	
23	285699A	FJÆR	SPRING, FLAT	
24	294520	SKRUE	SCREW, 2.3 X 3 MM PAN HD	
25	994104	PLATE	PLATE, MOUNTING, HEAD	
26	290842	SKRUE	SCREW, 3 X 6 MM PAN HD	
27	292171	SKRUE	SCREW, 3 X 12 MM PAN HD	
28	24C406A	FJÆR	SPRING	
29	890003	SKRUE	SCREW, SET, 3 X 8 MM	
30	890000	SKRUE	SCREW, SET, 3 X 5 MM	
31	282086	HODE	HEAD, ERASE	
32	290806	SKRUE	SCREW, 1.7 X 3 MM PAN HD	
33	287926A	PLATE	PLATE	
	292487	SKRUE	SCREW, 2 X 5 MM PAN HD	
	994180	HODE	HEAD, RECORD AND PLAY	
	294168	SKRUE	SCREW, 2 X 6 MM CSK HD	

## Switches and connectors

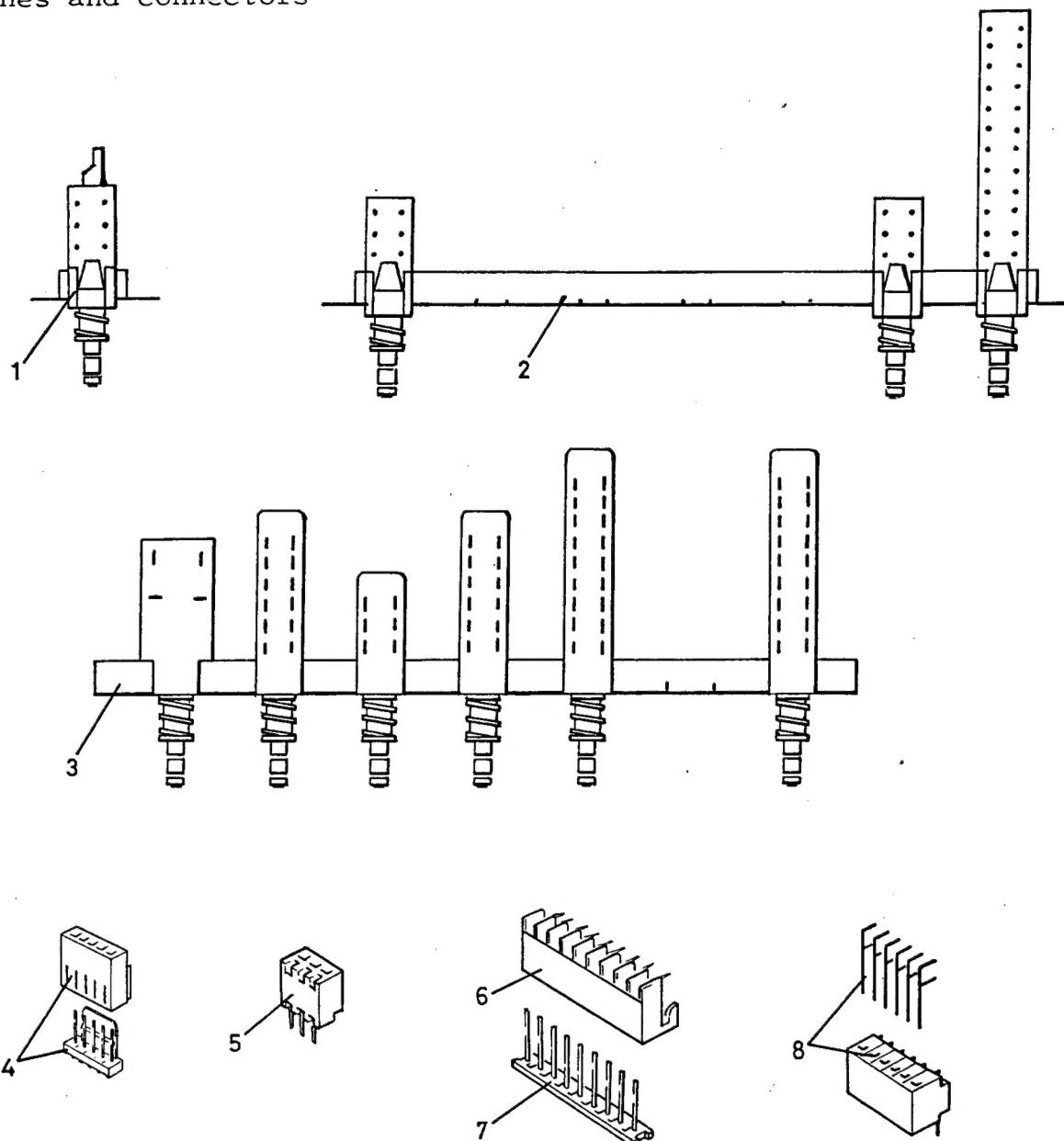


Fig.6 Switches and connectors

Index	SPECIFY THIS WHEN ORDERING		Description (notes)	Reference
	Ordering No.	Beskrivelse (merknader)		
1	*	VENDERE	SWITCHES	
2	300497 284902	VENDER	SWITCH, PUSH	PAUSE
3	308156	VENDER	SWITCH, PUSH	MPX FILTER, DOLBY NR., TAPE
4	*	KONTAKTER	CONNECTORS	POWER, REWIND, STOP, WIND, PLAY, RECORD
	995818	KONTAKT	CONNECTOR, 2 POLE, SMALL	
	995819	KONTAKT	CONNECTOR, 3 POLE, SMALL	
	995820	KONTAKT	CONNECTOR, 4 POLE, SMALL	
	995821	KONTAKT	CONNECTOR, 5 POLE, SMALL	
5	318320	KONTAKT	CONNECTOR, FIXED, 3 POLE	
6	347551	KONTAKT	CONNECTOR, FIXED, 9 POLE	
7	346222	PLINT	CONNECTOR, FIXED, 9 POLE	
8	996302 996303	KONTAKT	CONNECTOR, 3 POLE, BLACK	
		KONTAKT	CONNECTOR, 6 POLE, BLACK	

## Printed circuit boards

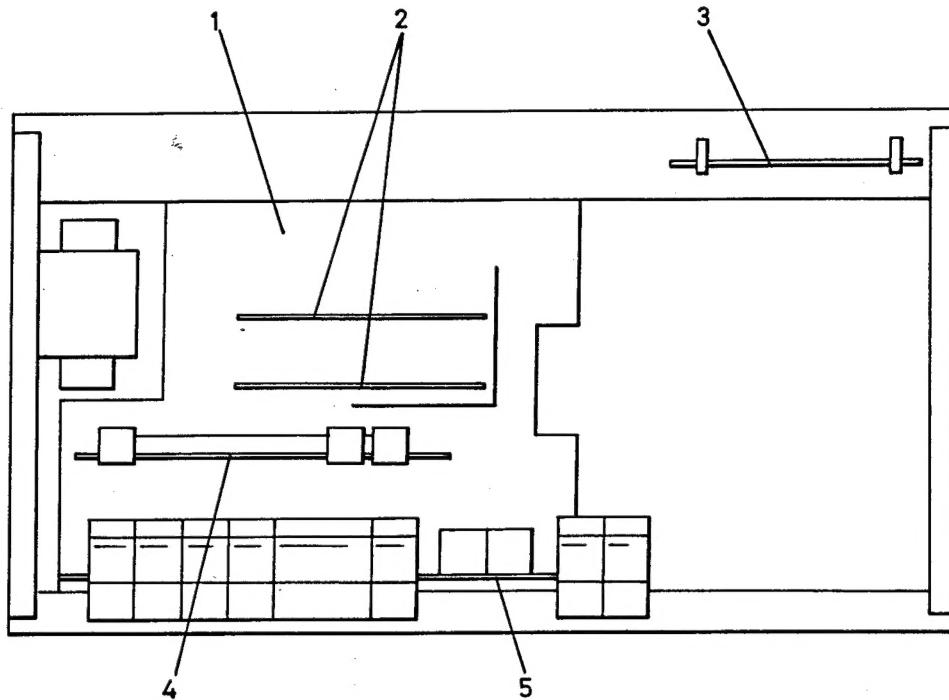


Fig.7 Printed circuit boards

SPECIFY THIS WHEN ORDERING		Description (notes)	Reference
Index	Ordering No.	Beskrivelse (merknader)	
1	*	TK PLATER	
1	994194	KORT	PRINTED CIRCUIT BOARDS
2	994197	KORT	BOARD, MOTHER
3	994198	KORT	BOARD, DOLBY
4	994196	KORT	BOARD, OSCILLATOR
4	994196	KORT	BOARD, AMPLIFIER, 2
5	994195	KORT	BOARD, AMPLIFIER, 1
	994199	KORT	BOARD, AMPLIFIER, 1
			A1
			A4
			A5
			A3
			A2, DIN MIC. SOCKET
			A2, JACK MIC. SOCKET

# TANDBERG

## TCD 310 Mk II

Tillegg og rettelser til Illustrert deleliste

Additional information and corrections to Illustrated Parts List

Side Page	Index	Del	Part	Correct Part. No.	Merknader Notes
3	36	Transformator	Transformer 115/230 V	358269	
	45	Ledning	Cable power, England	985356	English version
4	18	Vippe	Lever	293407A	
5	4	Skrue	Screw 3.5 x 6.3 mm	346854	
	17	Ring	Belt drive, rubber	300001	Below s.no. 4415300, see Figure 1
	17B	Ring	Belt drive, rubber	309600	From s.no. 4415301, see Figure 2
	15	Aksel	Spindle, tape reel	994113	Below s.no. 4415300, see Figure 1
	15B	Aksel	Spindle, tape reel	994187	From s.no. 4415301, see Figure 2
8	28	Hode	Head, erase, Tandberg	716331	Innføring av Tandberg viskehode. Ved utskifting erstatt med samme hodetype. Se Figur 3.
		Skrue	Screw, 1.2 x 11.5 mm	890008	Introduction of Tandberg erase head. Replace with same type of head.
		Skive	Washer, 1.4 mm	356947	See Figure 3.
9	32	Hode	Head, rec./playback	995115	U.S.-version
9	2	Vender	Switch, push	358700	From s.no. 4406300

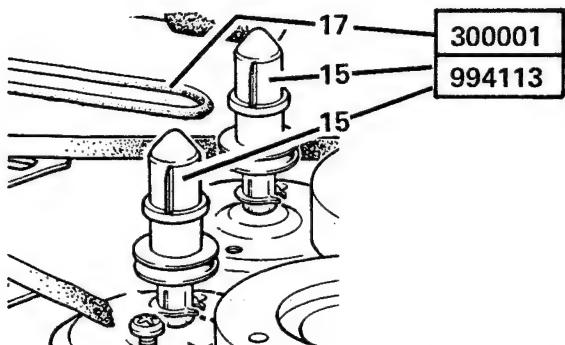


Fig.1. Counter drive belt, below s.no.4415300  
Telleverksrem, under s.nr.4415300

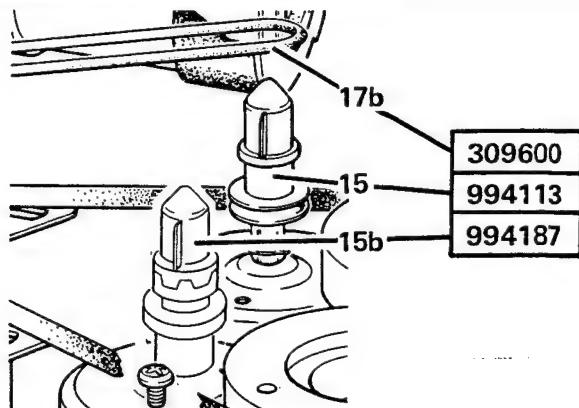


Fig.2. Counter drive belt, above s.no.4415300  
Telleverksrem, over s.nr.4415300

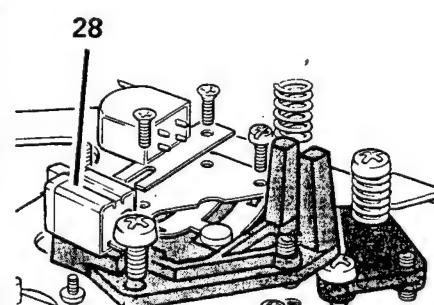
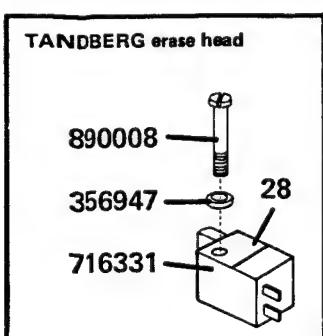


Fig.3. Two different types of erase heads  
To typer slukkehoder

Merk: Ved utskifting, erstatt med samme type hode.  
Note: Replace with same type of head

# **TANDBERG**

## **TCD 310 Mk II**

### **Circuit Diagram**

**—TANDBERG—  
ZENTRAL-SERVICE**

Jochen Schmidt

Am Strasserfeld 2

Telefon (0211) 203076 - Telefax (0211) 202954  
4000 DÜSSELDORF 12 UNTERBACH

**—TANDBERG—  
ZENTRAL-SERVICE**

Jochen Schmidt

Am Strasserfeld 2

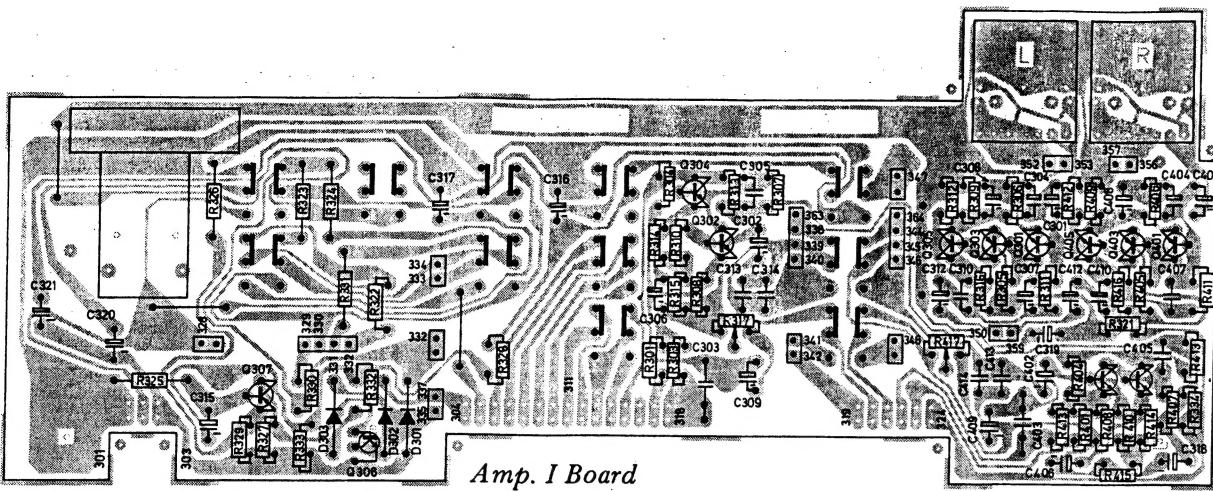
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4000 DÜSSELDORF 12 UNTERBACH

FROM SERIAL NO. 4400326

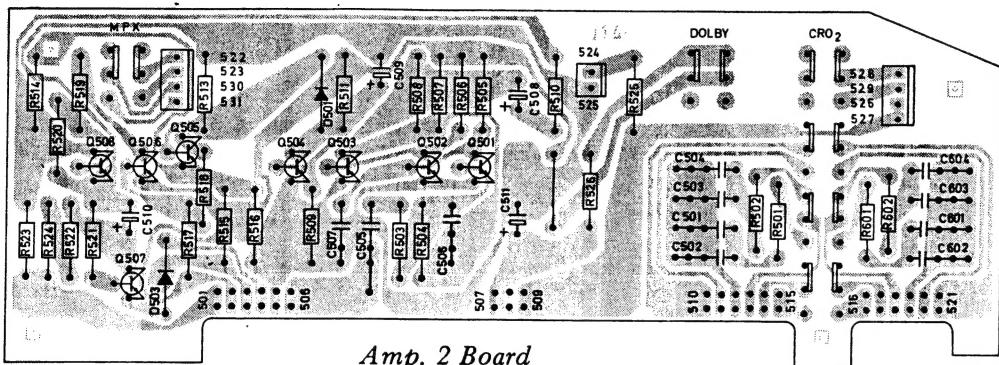
1458 - 11 - 76 Part No. 714025  
Printed in Norway by Petlitz

# **TANDBERG**

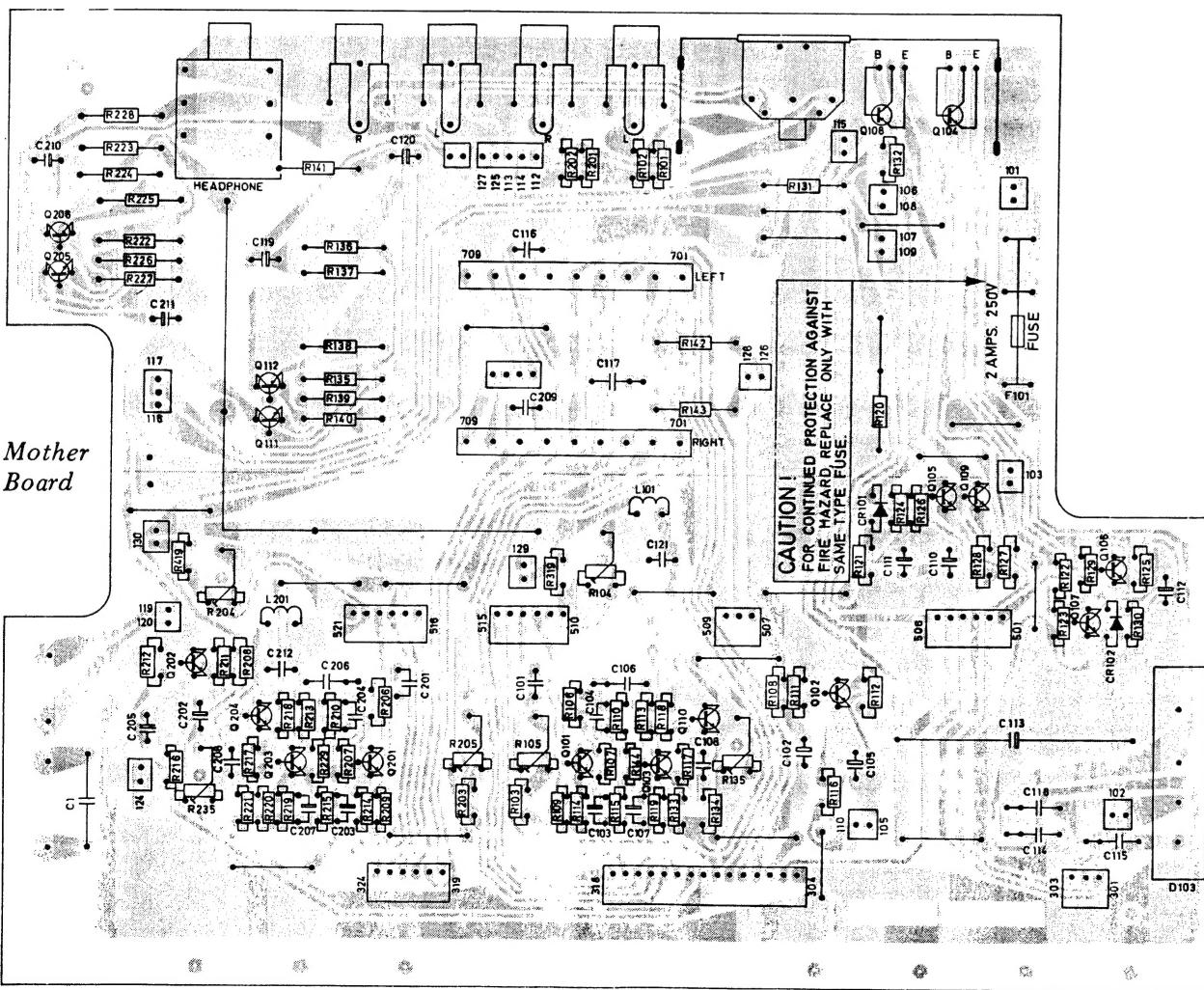
## **TCD 310 Mk II**



### *Amp. I Board*

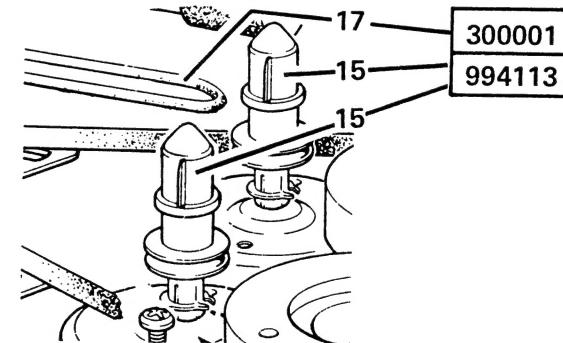


Amp. 2 Board

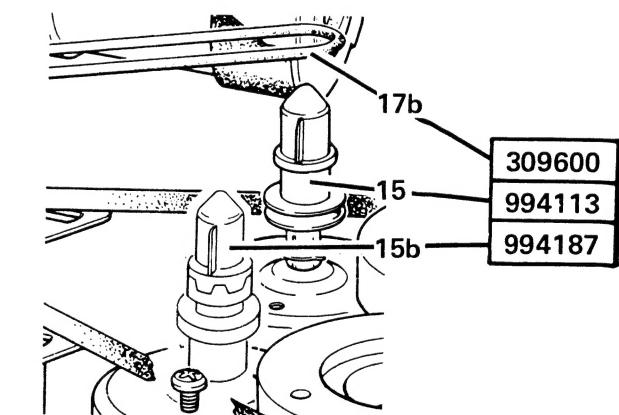


## *Mother Board*

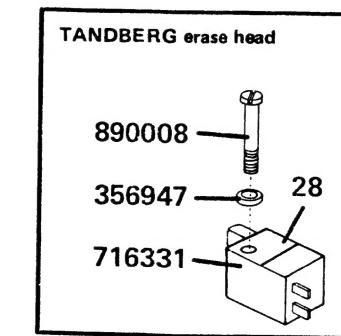
Side Page	Index	Del	Part	Correct Part. No.	Merknader Notes
3	36	Transformator	Transformer 115/230 V	358269	
	45	Ledning	Cable power, England	985356	English version
4	18	Vippe	Lever	293407A	
5	4	Skrue	Screw 3.5 x 6.3 mm	346854	
	17	Ring	Belt drive, rubber	300001	Below s.no. 4415300, see Figure 1
	17B	Ring	Belt drive, rubber	309600	From s.no. 4415301, see Figure 2
	15	Aksel	Spindle, tape reel	994113	Below s.no. 4415300, see Figure 1
	15B	Aksel	Spindle, tape reel	994187	From s.no. 4415301, see Figure 2
8	28	Hode	Head, erase, Tandberg	716331	Innføring av Tandberg viskehode. Ved
		Skrue	Screw, 1.2 x 11.5 mm	890008	utskifting erstatt med samme
		Skive	Washer, 1.4 mm	356947	hodetype. Se Figur 3.
					Introduction of Tandberg erase head. Replace with same type of head. See Figure 3.
9	32	Hode	Head, rec./playback	995115	U.S.-version
9	2	Vender	Switch, push	358700	From s.no. 4406300



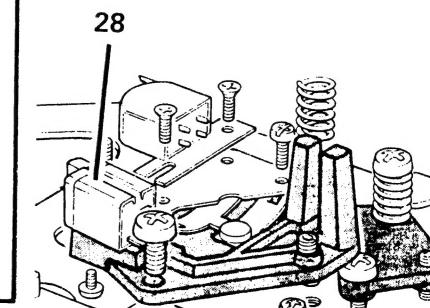
*Fig.1. Counter drive belt, below s.no. 4415300  
Telleverksrem under s.nr 4415300*



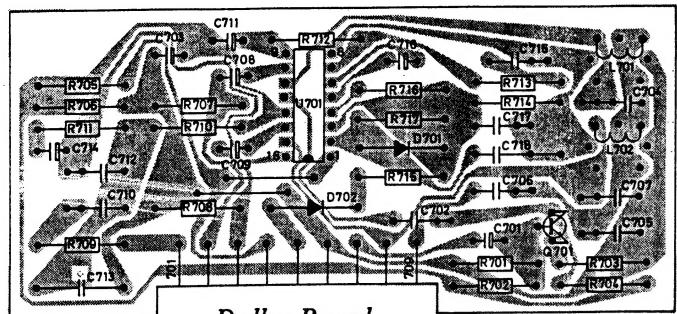
*Fig.2. Counter drive belt, above s.no.4415300  
Telleverksrem, over s.nr.4415300*



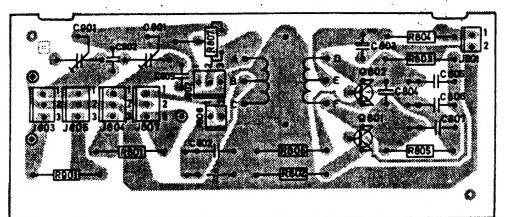
*Fig. 3. Two different types of erase heads  
To typer slukkehoder*



*Merk: Ved utskifting, erstatt med samme type hode.*  
*Note: Replace with same type of head.*

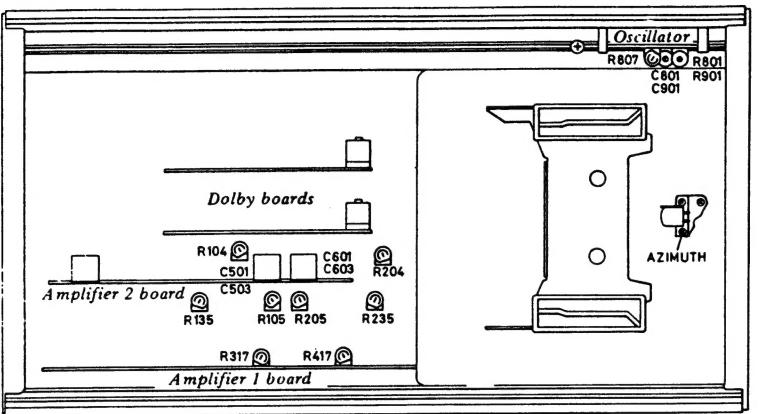


Dolby Board



Osc. Board

## ELECTRICAL CHECKS AND ADJUSTMENTS FOR TCD 310 Mk II



Location of test points and adjustable components

### GENERAL

- “0 dB” level is defined as 775 mV. Thus – 5 dB equals 450 mV and – 35 dB equals 14 mV.
- Make the adjustments in the order in which they are listed here. Many of the adjustments require that previous adjustments have already been correctly made. It is especially important that adjustment for SPECIAL tape be made before adjustment for NORMAL tape.
- Clean and degauss the tape path before and after the adjustments. It is assumed that the tape path has already been correctly adjusted as described in the Service Manual for the TCD 310.

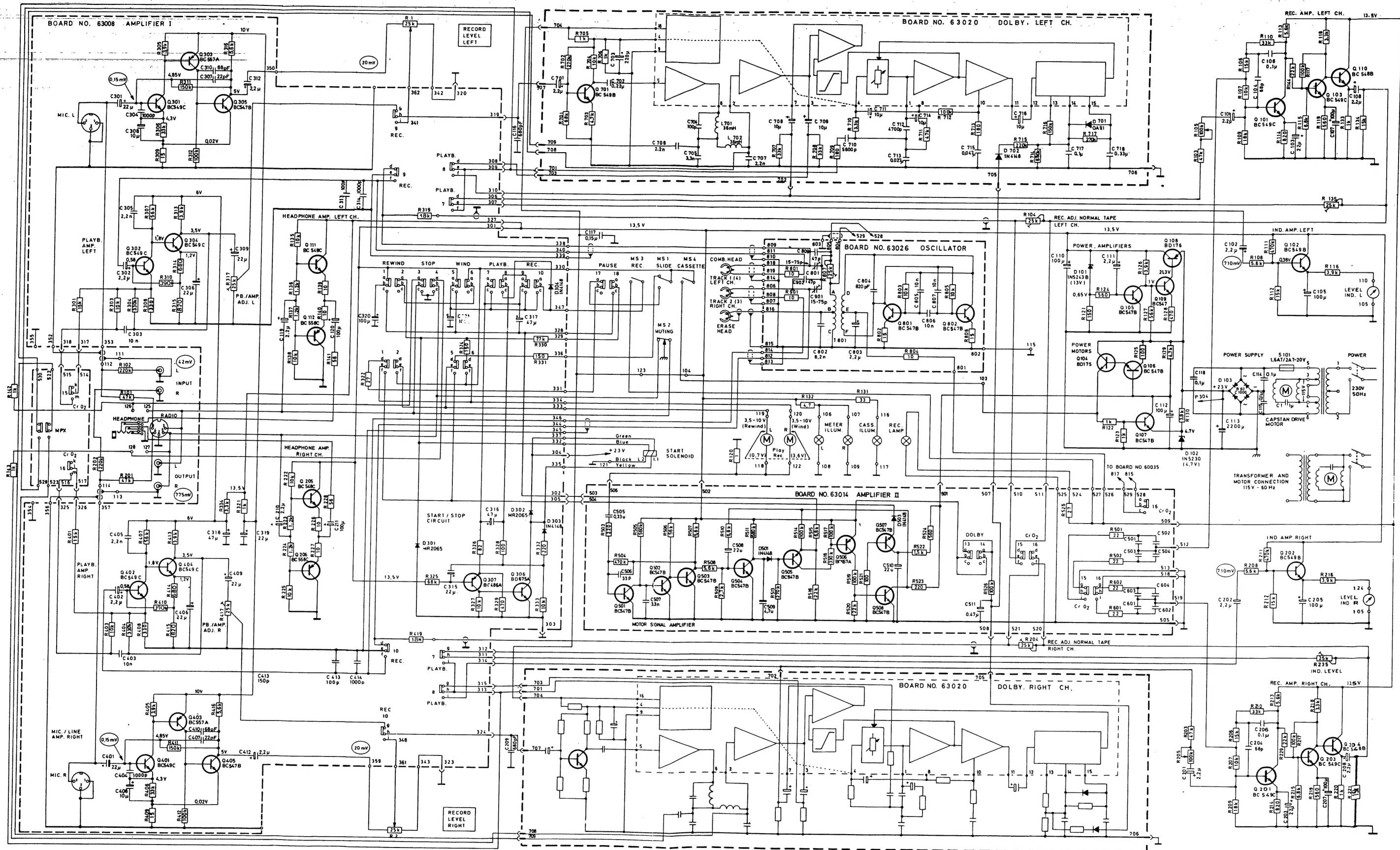
### NECESSARY EQUIPMENT

- 2 high impedance voltmeters (do NOT use universal meters).
- Frequency counter.
- Audio generator.
- Distortion meter.
- Wow meter (required for wow test only).
- Hum/noise meter (required for signal/noise test).
- Tandberg test tapes No. 21 (1,000 Hz speed test), No. 22 (3,150 Hz wow test), No. 23 (6,300 Hz azimuth test) and No. 24 (1,000 Hz playback level).
- TDK C60 SA or equivalent.
- Maxell C60 UD or equivalent.

No.	Adjustment or check	Tape	Set the cassette deck to	Measuring instrument	Measure at	Correct reading	Adjust	Comments
1	Record/playback head azimuth	No. 23	Playback	Voltmeters	OUTPUT sockets	Maximum output signal. Difference between the tracks: < 4 dB	Azimuth screw on head	Adjust to best compromise
2	Playback level	No. 24	Playback	Voltmeters	OUTPUT sockets	775 mV	R317 (left channel) R417 (right channel)	—
3	Tape speed	No. 21	Playback	Frequency counter	OUTPUT socket	± 1% (990 – 1010)	—	—
4	Wow	No. 22	Playback	Wow meter (according to DIN 45507)	OUTPUT socket	≤ 0.2% (DIN 45511 peak weighted)	—	Measure at end of tape. Measure both in vertical and horizontal position.
5	Oscillator frequency	SPECIAL	SPECIAL Recording	Frequency counter	Connect inductively to erase head (see comments)	80 – 100 kHz	—	Connection is made with a coil or a few turns of ordinary wire. Instead of a frequency counter a long-wave receiver (tuned to 3rd. harmonic) can be used.
6	Oscillator erase voltage	SPECIAL	SPECIAL Recording	Voltmeter	Across erase head	28 – 32 V	—	—
7	Oscillator	SPECIAL	SPECIAL	Voltmeters	OUTPUT	≤ 2 mV	—	INPUT sockets open.

No.	Adjustment or check	Tape	Measuring instrument	Measure at	Procedure
2 ADJUSTMENT FOR SPECIAL TAPE					
2.1	Bias (preadjustment)	SPECIAL	Voltmeters	R801 (left channel) R901 (right channel) see “location” drawing	Set the cassette deck to SPECIAL recording and adjust C801 (left ch.) and C901 (right ch.) to readings of approximately 6–8 mV. (Measure between ground and the side of the resistor which is connected to the head).
2.2	Recording level	SPECIAL	Voltmeters	OUTPUT sockets	Set the cassette deck to SPECIAL recording. R1 and R2 to mid-position. Connect an audio generator to the INPUT sockets. Adjust the generator to 400 Hz, – 5 dB (= 450 mV on the voltmeters). [– 5 dB is used instead of 0 dB in order to avoid inaccurate results caused by varying tape characteristics.]
					Rewind and play back. The voltmeters should now read – 5 dB (= 450 mV) ± 0.5 dB. If outside the tolerance, make a new recording while adjusting R105 (left channel) and R205 (right channel) as required. Then play back and check once more.
2.3	Overall frequency response (adjustment)	SPECIAL	Voltmeters	OUTPUT sockets	Set the cassette deck to SPECIAL recording. Adjust the generator to – 35 dB (= 14 mV on the voltmeters) and record a 400 Hz and a 10,000 Hz signal at this level. Rewind and play back. Use the 400 Hz signal as a reference and check on both channels that the 10,000 Hz signal is within the following tolerance: – 0 dB to +5 dB. If outside the tolerance adjust C801 and C901 (bias). Then make a new recording, play back and check once more.
2.4	Distortion	SPECIAL	Distortion meter	OUTPUT sockets	Set the cassette deck to SPECIAL recording. Generator to 1000 Hz, 0 dB (= 775 mV on the voltmeters). Rewind and play back. Check that the distortion is ≤ 3%. If outside the tolerance adjust C801 and C901 (bias). Make a new recording, play back and check once more. Then repeat step 2.3
2.5	Overall frequency response (check with DOLBY)	SPECIAL	Voltmeters	OUTPUT sockets	Set the cassette deck to SPECIAL DOLBY (!) recording. Adjust the generator to – 35 dB and record the following frequencies: 400 Hz, 55 Hz, 1000 Hz, 4000 Hz, 10,000 Hz, 14,000 Hz. Rewind and play back. Use the 400 Hz signal as a reference, and check that the other signals are within the following tolerances:  55 Hz: – 3 dB to +2 dB      10,000 Hz: 0 dB to +5 dB 1000 Hz: – 2 dB to +2 dB      14,000 Hz: – 2 dB to +5 dB 4000 Hz: – 2 dB to +4 dB  If outside the tolerances try changing the values of C501/C502 (left ch) and C601/C602 (right ch). Increased values give higher treble response.
2.6	Indicators	SPECIAL	Indicators		Record a 400 Hz, 0 dB signal and adjust R135 (left ch) and R235 (right ch) to 0 dB deflection on both indicators.

No.	Adjustment or check	Tape	Measuring instrument	Measure at	Procedure															
3 ADJUSTMENT FOR NORMAL TAPE																				
3.1	Recording level	NORMAL	Voltmeters	OUTPUT sockets	Same as in step 2.2, except that the SPECIAL button is released. If outside the tolerance adjust R104 (left ch) and R204 (right ch). DO NOT TOUCH R105 OR R205.  NOTE! Adjustment of R104 and R204 will not affect the readings on the indicators of the cassette deck.															
3.2	Overall frequency response (adjustment)	NORMAL	Voltmeters	OUTPUT sockets	Same as in step 2.3, except that the SPECIAL button is released. If outside the tolerance adjust R807. DO NOT TOUCH C801 OR C901.															
3.3	Distortion	NORMAL	Distortion meter	OUTPUT sockets	Same as in step 2.4, except that the SPECIAL button is released. Is outside the tolerance adjust R807. Then repeat 3.2. DO NOT TOUCH C801 OR C901.															
3.4	Overall frequency response (check with DOLBY)	NORMAL	Voltmeters	OUTPUT sockets	Same as in step 2.5, except that the SPECIAL button is released. Tolerances:  55 Hz: – 3 dB to +2 dB      10,000 Hz: – 2 dB to +5 dB 1000 Hz: – 2 dB to +2 dB      14,000 Hz: – 3 dB to +4 dB 4000 Hz: – 2 dB to +4 dB  If outside the tolerances try changing the values of C503/504 (left ch) and C603/C604 (right ch). Increased values give higher treble response.															
3.5	Erasure	SPECIAL	Voltmeters	OUTPUT sockets	Record a 1000 Hz, 0 dB signal. Rewind and erase. Then rewind once more and play back the erased piece. The voltmeters should read < – 62 dB.															
3.6	Signal/noise	SPECIAL	Hum/noise and meter	OUTPUT sockets	The signal/noise ratios at 3% distortion should be at least as good as specified in the table below:  <table border="1" style="margin-left: auto; margin-right: auto;"><tr><th>DOLBY N.R.</th><th>OFF</th><th>ON</th></tr><tr><td>Signal/tape noise:</td><td>NORMAL</td><td>SPECIAL</td></tr><tr><td>DIN 45511 (Geräuschspannung)</td><td>46 dB</td><td>49 dB</td></tr><tr><td>DIN 45511 (Fremdspannung)</td><td>46 dB</td><td>48 dB</td></tr><tr><td></td><td>50 dB</td><td>58 dB</td></tr></table>	DOLBY N.R.	OFF	ON	Signal/tape noise:	NORMAL	SPECIAL	DIN 45511 (Geräuschspannung)	46 dB	49 dB	DIN 45511 (Fremdspannung)	46 dB	48 dB		50 dB	58 dB
DOLBY N.R.	OFF	ON																		
Signal/tape noise:	NORMAL	SPECIAL																		
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	50 dB	58 dB																		



All voltages are measured with V.T.V.M.

with input impedance min. 10 Mhos.

All DC voltages measured without signal

(mV) Denotes signal voltages (1000Hz)

1mV Denotes DC voltages

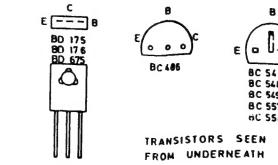
(10V) Denotes voltages in operated mode

L = Left channel (Track 1 or 4)

R = Right channel (Track 2 or 3)

→ = Connector

○ 101 = Connection terminal



	POWER	REW.	STOP	WIND	PLAYB.	REC.	M.P.X	DOLBY	SPEC.	PAUSE
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0

ALL SWITCHES IN UNOPERATED POSITION

15 16